DOCUMENT RESUME

ED 279 866 CE 046 584

AUTHOR Rockwell, S. Kay; Tate, Thomas G.
TITLE Interactive Videodisc in Extension: Strategies for Assessing the Technology's Application. NCES Videodisc Report No. 11.
INSTITUTION Nebraska Univ., Lincoln. Cooperative Extension Service.
PUB DATE Oct 86
NOTE 22p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Education; *Evaluation Criteria; *Evaluation Methods; *Extension Education; *Instructional Material Evaluation; *Interactive Video; Postsecondary Education; *Videodisks

ABSTRACT

This guide is intended to assist cooperative extension personnel in developing, using, and evaluating interactive videodisk programs designed for adult learning situations. The first part of the guide discusses the benefits of interactive video as an instructional medium and describes a pilot project funded by the Extension Service and U.S. Department of Agriculture entitled "Cash Flow Planning for Farmers." Procedures for evaluating the pilot project and replicating it at county sites are outlined along with the feedback obtained from the farmers who tested the program concerning what they liked or would have liked to see included in the program. The second part of the guide, which deals with evaluating interactive videodisks in cooperative extension, includes general evaluation guidelines, procedures for conducting a process evaluation throughout the planning and production stages (questions for the planning and production stages and questions related to check discs), and techniques for assessing the utilization of interactive videodisk in cooperative extension (short- and long-term needs). The final section, which covers the implications of interactive videodisk for research in adult education, discusses research on and research with videodisks. The guide is a combination of two papers, "Utilization of Interactive Videodisc for Informal Adult Education" (originally presented at the October 1986 meeting of the American Association for Adult and Continuing Education) and "Interactive Videodisc in Extension: Strategies for Assessing the Technology's Application" (originally presented at the American Evaluation Association's October 1986 meeting.) (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

BEST COPY AVAILABLE

NCES Videodisc
Report NO. 11

ED279866

INTERACTIVE VIDEODISC IN EXTENSION:

STRATEGIES FOR ASSESSING THE TECHNOLOGY'S APPLICATION

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

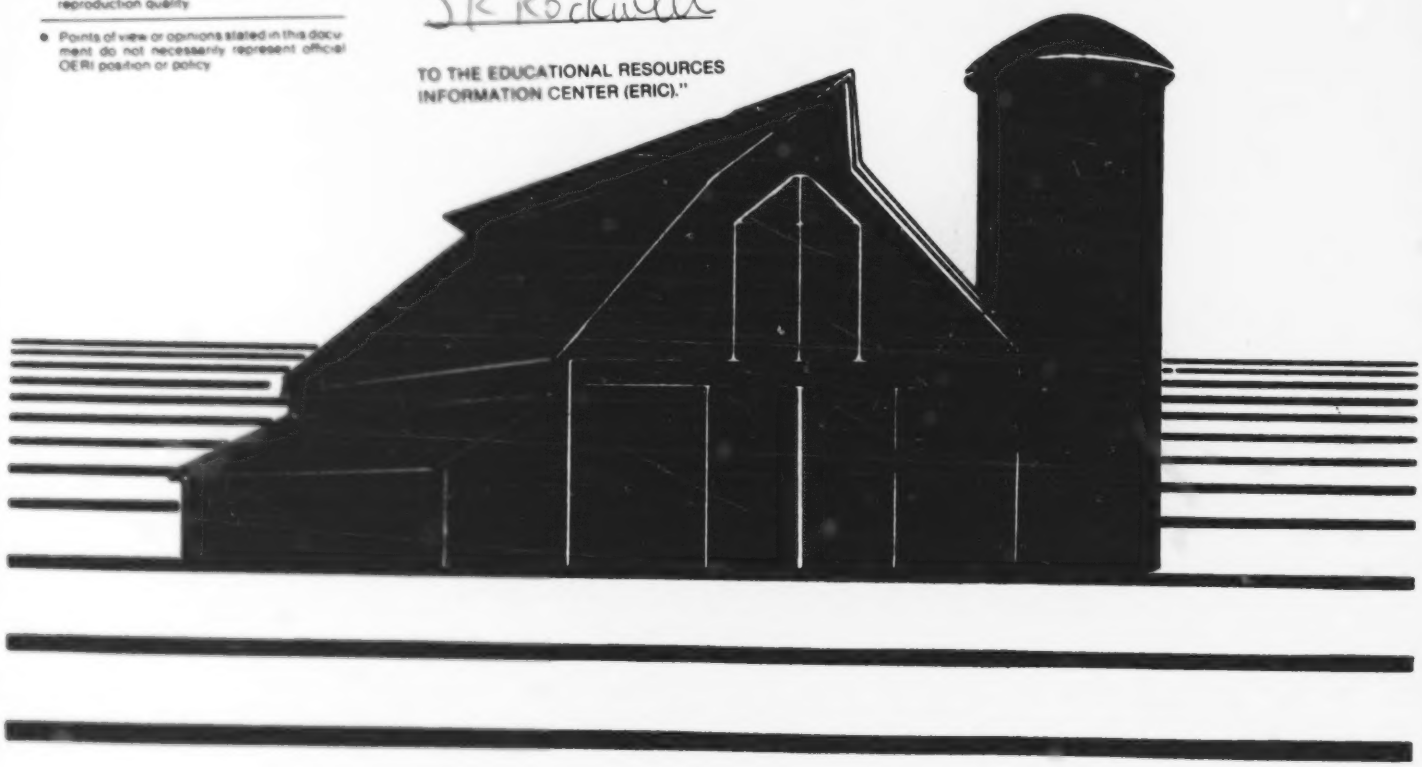
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

S K Rockwell

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."



Nebraska Cooperative Extension Service

INTERACTIVE VIDEODISC PROJECT

OCCASIONAL PAPER SERIES
Department of Agricultural Economics
University of Nebraska-Lincoln
Lincoln, NE 68583-0922

QE 946 S84

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Lee E. Lucas, Director of Cooperative Extension Service, University of Nebraska, Institute of Agriculture and Natural Resources.

The Cooperative Extension Service provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.

INTERACTIVE VIDEODISC IN EXTENSION:

STRATEGIES FOR ASSESSING THE TECHNOLOGY'S APPLICATION

by

S. Kay Rockwell
Cooperative Extension Service
University of Nebraska-Lincoln

Thomas G. Tate
USDA Extension Service
Washington, DC

A combination of two papers:

Utilization of Interactive Videodisc for Informal Adult Education presented at the American Association for Adult and Continuing Education, Hollywood, Florida, October 24, 1986.

Interactive Videodisc in Extension: Strategies for assessing the Technology's Application presented at the American Evaluation Association, Kansas City, Missouri, October 31, 1986.

INTERACTIVE VIDEODISC IN EXTENSION:

STRATEGIES FOR ASSESSING THE TECHNOLOGY'S APPLICATION

Contents Page

Why Interactive Video? 1

An Application of Interactive Video in the Cooperative Extension Service 3

Overview of the Project 5

Evaluation of the Implementation and Acceptance of the Interactive Videodisc Program 6

Evaluating Interactive Videodisc in Cooperative Extension 9

General Guidelines 9

Process Evaluation Throughout the Planning and Production Stages 10

Assessing the Utilization of Interactive Videodisc in Cooperative Extension. 11

Implications of Interactive Videodisc for Research in Adult Education 13

Research On Videodisc 13

Research With Videodisc 14

Summary 15

References 17

INTERACTIVE VIDEODISC IN EXTENSION: STRATEGIES FOR ASSESSING THE TECHNOLOGY'S APPLICATION

Cooperative Extension Service (CES), like many other tax supported institutions is under tremendous pressure to maintain or increase its level of program delivery to increasingly diverse audiences. At the same time, tax support for CES is not expanding and in some cases is declining. The Cooperative Extension system with its commitment to serve the public, nearly 100 million times in 1986, must constantly examine new delivery systems to see if they provide economical, strategic, ecological, and/or social benefits. If a new delivery system does provide one or more of these benefits, is it economically and organizationally feasible to continue implementation of such an innovative delivery system?

Interactive video -- a new technology resulting from the merger of computer technology with television technology -- appears to be a powerful tool which can be applied in adult learning situations. However, for an adult educational system such as CES to utilize interactive video as part of the delivery system in the future, it must begin now to fully understand the design, development, and utilization features of the medium.

Exploring the applicability of interactive video technology as a teaching method for adults can be challenging, exciting, and sometimes very confusing or frustrating. Many questions need to be addressed as this new technology is field tested. How do clientele react to the teaching method? Is the program appropriate in various parts of the country? What type of budgetary support is needed? What kind of staff support is needed to implement the utilization of the programs? What types of supportive materials are needed along with the programs?

To begin to meet the challenge of testing interactive video as an educational delivery method in CES, a pilot project was funded by a grant from ES-USDA to design, produce, and evaluate an instructional interactive videodisc program. The program, "Cash Flow Planning for Farmers", was designed to assist users in learning how to prepare a cash flow plan and then in applying this knowledge in preparing a cash flow plan for their own farming business.

Why Interactive Video?

Interactive video has unique advantages over linear programming which allow for enhancing the transfer of information. By combining video technology with computer technology, the instructional segment becomes self-paced and individualized for the adult learner. Furthermore, the medium can be used in various situations and at times which are convenient to the adult learner.

The unique advantages of interactive video appear to offer certain benefits for program delivery in CES. Those identified by Deter (1986) include:

(a) cost-effective delivery,

(b) extending the specialists outreach ability,

(c) potential for increasing the number of clientele served,

(d) delivery of expertise to locations currently out of reach,

(e) maintain and increase program delivery in times of limited resources,

(f) provide information delivery at times and places not currently served,

(g) increase the rate of knowledge retention, and

(h) obtain statistics on clientele needs through the use of built-in evaluations.

In 1984, Daynes and Butler identified over 230 instructional programs available on videodisc. Although the testing and evaluating of these instructional applications are primarily in their infancy, evidence is emerging which suggests that interactive video is an effective instructional tool in various educational and training situations.

Bunderson et al. (1984), Hannifin and Schaffer (1984), Gibbons et al. (1982), DeBloois (cited in DeBloois et al., 1984), and Vadas (1986) all found greater learning gains for videodisc students when compared with a specific traditional method. Bunderson et al. (1981) and Smith (1985) observed that the total time in instruction for videodisc students was reduced by 25 percent or more when compared to traditional educational methods. In addition, Bunderson found that outside study time for videodisc students decreased by 41 percent when compared with a classroom group.

Andriessen and Kroon (1980) found that interactive videodisc subjects liked the personal control of the materials, the ability to repeat segments, and the ability to jump through materials; however, some subjects missed the teacher contact and the social environment of the classroom. DeBloois (cited in DeBloois et al., 1984) showed that farmers felt more positive about the learning experience with interactive videodisc than with the linear videotape materials. DeBloois and Woolley (cited in DeBloois et al., 1984) found that participants using Army training videodisc materials enjoyed the lessons, and felt the lessons were very effective; the computer and videodisc was very dependable, and the pace of learning was appropriate. Gibbons et al. (1982) found that popular features of the interactive videodisc tended to be self-pacing, clarity and understandability of the message due to its

organizational properties, and the realism of problems used. Bunderson, Olsen, and Baillio (1981) reported students having very positive attitudes toward videodisc instruction.

The evidence documenting equal or better knowledge gain, less time required for the educational process, and positive feelings about instruction via videodisc can not be ignored in adult educational systems. The challenge is upon us to assess the application of this new technology in the adult education arena.

An Application of Interactive Video In The Cooperative Extension Service

To explore the potential for using interactive video in Cooperative Extension, a pilot project was funded by a grant from Extension Service-United States Department of Agriculture (ES-USDA) to design, produce, and evaluate an interactive video instructional program. The program, "Cash Flow Planning for Farmers," assists farmers/ranchers in learning about the topic and then in preparing a cash flow plan for use with their own business.

Overview of the Project

"Cash Flow Planning" was designed in two parts--the instructional segment and the "enter-your-own-data" segment. The instructional segment taught skills for cash flow planning and was an interactive videodisc program. The "enter-your-own-data" segment was a computer program which was complimented by the instructional videodisc program. A workbook was developed for farmers/ranchers to use along with the program.

The design for the instructional segment consisted of the presentation of a concept followed by test questions. Depending on the answers to the questions, users either went on to the next concept or went through a remediation loop. The remediation loop either repeated the specific instructional segment or was altered to explain the concept in another manner. After completing the instruction on the concept, the user returned to the main menu to select the next topic.

When the instructional segment was completed, the user was directed to proceed to the 'enter-your-own-data' segment which applied the information to the farmer's own specific cash flow plan. The 'enter-your-own-data' segment returned the user to the instructional videodisc if the user had questions about the process, or if the user forgot how to calculate or enter certain items.

The hardware for the Level III interactive videodisc system used in the project was (a) a microcomputer, (b) a videodisc player, (c) a video monitor or television, (d) a printer, and (e) the cables to link the equipment. An equipment manual providing instructions for setting up and operating the equipment accompanied the videodisc.

Directors from 18 State Extension Services agreed to purchase the necessary equipment to operate the program and involve at least one Extension Agent in a selected county to participate as a test site for the program. The states were Georgia, Idaho, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, North Carolina, North Dakota, Oregon, Pennsylvania, South Carolina, Utah, and Virginia. In Nebraska there were 11 test sites.

Evaluation of the Implementation and Acceptance of the Interactive Videodisc Program

A study was designed to evaluate the computer directed videodisc technology as a delivery method for CES. The study focused on the problems associated with getting the interactive videodisc into operation in an extension office; and then tested the reactions of farmers/ranchers to both the educational program and to the videodisc technology.

Open-ended questionnaires were used to collect data from Extension Agents at the target sites. A total of 25 Agents in 12 states reported about their preparation for using the videodisc. A total of 19 Extension Agents in 10 states reported on the implementation process. Extension Agents in 10 states also completed anecdotal notes about the individuals who participated in the program.

Questions soliciting clientele reactions were included in the computer program and recorded on a floppy disk. Initial user reactions were recorded from April to July of 1986. Out of the 92 recorded responses, there were 48 farmers or ranchers, 13 lenders, 24 Extension Agents, and 7 other people. Full scale testing will occur during winter/spring 1987.

Cost

Bitney et al. (1986) compared the cost for teaching a farmer/rancher how to develop a cash flow plan along with follow-up coaching in the application of the materials (Figure 1). The three scenarios compared were (a) an extension agent doing all the teaching and coaching, (b) an extension agent using the videodisc as a supplement to live teaching and coaching, and (c) an extension agent serving only as an overseer, utilizing the interactive videodisc for both teaching and coaching.

FIGURE 1

Cost Comparison of Alternative Instructional Methods

	Extension Agent	Ext. Agent/Videodisc	Videodisc
Teaching farmer how to develop a cash flow plan	4 hr @ $15=$60	2 hr @ $15=$30	-0-
Coaching farmer in developing cash flow plan	4 hr @ $15=$60	2 hr @ $15=$30	1 hr @ $15=$15
Cost of videodisc equipment[a]	-0-	$10	$10
Cost per farmer	$120	$70	$25

[a] $3,800 Investment in equipment
500 Cost of disc and software
$4,300 (Used 4 years, 100 users per year)

Although this is a very simplistic comparison and is built on some heroic assumptions, it illustrates the potential cost effectiveness of videodisc instruction. Other variables which will significantly influence the per user cost of videodisc instruction in future years will included (a) multiple uses of the equipment for other videodisc programs and (b) a reduction in the initial cost of the equipment as the technology advances.

Preparation For and Implementation Of the Videodisc at the County Site

The majority of the Extension offices where the videodisc was tested had the computer related equipment which was necessary to run the program but needed to purchase the videodisc player. Only 1 out of 25 test sites indicated having difficulty adapting their existing equipment for the videodisc project.

Most of the Extension Agents (89%) indicated the equipment manual was sufficient to prepare them to set up to equipment. Problems arose when the computer was a different brand than the one described in the manual.

Extension Agents at half of the sites (53%) indicated they had problems utilizing existing equipment. Over half the problems related to the computer program ('Enter-your-own data') section.

Although the computer equipment was available, there was a concern expressed about utilization of the videodisc program beyond the pilot project. This concern was that the utilization of the equipment for clientele use of the videodisc might start competing with the time the equipment is needed for office operation. In addition, utilizing the

equipment at sites other than the Extension office would necessitate purchasing equipment for each site (Note: Bitney et al. identified the total cost of equipment for the project at approximately $3,700 in 1986).

Most of the Extension Agents (89%) indicated that a trial run of the program was sufficient training for them to help clientele use the program. However, it was suggested that a better understanding of the technology and the terminology would be helpful. Therefore, preparation of an orientation videotape which describes the program, the technology, and the equipment set up might prove to be a very valuable aid to the Extension Agent.

Utilization Of the Cash Flow Planning Videodisc at the County Sites

For the pilot project, Extension Agents relied most heavily on personal contact to promote the program and recruit participants. However, they also used mass media and some of them received good television and newspaper coverage about the project.

Of the 25 test sites, 72 percent used the cash flow interactive videodisc as a stand alone program. Another 20 percent used it as supplemental to other programs, with 8 percent using it in both capacities.

In 86 percent of the county sites, the Extension Agent was the person who oriented the client about using the computer and the videodisc. The amount of time spent orienting the client ranged from 3 minutes to 30 minutes with an average time of about 12 minutes.

The amount of time farmers/ranchers spent working on the program ranged from 60 minutes to 161 minutes with an average time of 102 minutes. A common complaint was that it took too long to complete the program.

Although there was a workbook developed and provided for use along with the videodisc program, only half (47%) of the participants used the reference. Since there was no mention of this supplementary reference material on the videodisc program, it is recommended that supplementary materials be identified and illustrated at the beginning of the videodisc program. Another option to explore for the utilization of supplementary materials might be to magnetically store them and provide a print option.

Participant Reactions to the Use of the Cash Flow Program

Design factors which program users liked (or would have liked) included:

(a) a map (as part of the main menu) which showed the structure of the program,

(b) an escape option so they could exit at any time from a learning segment,

(c) a quit option so they could quit participation at any point and re-enter again without repeating the instruction,

(d) an interrupt key so they could stop more frequently,

(e) immediate feedback on each question so the user knew if the response was correct or incorrect, and

(f) a remediation loop which specifically addressed an incorrect response.

Out of 46 farmers, 58 percent worked on the program by themselves and 42 percent worked as a group. Where one or more additional persons participated in the program, one of the additional persons was the farmer's spouse. Although the individual averaged 97 minutes and the groups averaged 118 minutes working on the program, there was no significant difference between these two figures.

Nearly 3/4 of the farmers (71%) had very little or no computer experience prior to their work with the cash flow videodisc program; 41 percent had very little or no typewriter experience.

Farmers were allowed to identify up to three reasons why they were interested in participating in the "Cash Flow Planning" videodisc. Their responses included:

(a) to improve farm management ability -- 83%

(b) to increase farm management knowledge -- 71%

(c) they were curious about the program -- 56%

(d) to learn about cash flow basics -- 25%

(e) to develop a cash flow plan for use with lender -- 23%

(f) to determine financial position -- 17%

Out of the 48 farmers, 42 percent had not used a cash flow plan before. Out of the remaining 28 farmers, 18 percent had used a cash flow plan for only one year.

Farmers (n=48) and lenders (n=13) provided their reactions to the cash flow plan resulting from their participation in the videodisc program. Their responses were:

(a) 94 percent of both the farmers and the lenders felt the plan was very or quite complete,
(b) 96 percent of both the farmers and the lenders felt the plan was quite or very realistic,

(c) 100 percent of the farmers and 93 percent of the lenders felt they would place some or a great deal of confidence in the plan, and

(d) 71 percent of the farmers and 85 percent of the lenders said the plan would have a great deal of influence on the lender's decision to grant a loan.

Reactions to Videodisc Instruction

Users were asked 16 questions which rated their feelings about the learning experience with the videodisc technology. The 5-point scale used was: 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree. As a group, their responses ranged from agreeing to strongly agreeing with each statement. The statements (with the mean scores) were:

(a) Personal application
--Time passed quickly while I was using this videodisc (1.9)
--This lesson allowed me to meet my own learning needs and interests (1.9)
--In taking this lesson I was challenged to do my best work (2.0)
--This videodisc allowed me to be very actively involved in my own learning (1.7)
--My interest in developing a cash flow plan has increased because of this lesson (2.0)

(b) Future utilization
--I would recommend this videodisc to my friends (1.5)
--I would take another course with a videodisc (1.5)

(c) Use of keyboard and understanding of content
--The keyboard was easy to read and use (1.5)
--The videodisc materials were clear and easy to read (1.8)
--The cash flow lesson was clear and easy to understand (1.7)
--The content was at the right level of difficulty (2.0)

(d) Instructional techniques
--The cash flow practice problems were very helpful (1.8)
--The cash flow answers and feedback were helpful (1.8)
--The cash flow examples were good (1.8)
--The lesson menus were helpful (1.7)
--The motion sequences were important (1.8)

Evaluating Interactive Videodisc in Cooperative Extension

General Guidelines

Branden (1986) describes interactive video as a "rare and wonderful example of what happens when technologies merge....coming together are two electric technologies (computers and television) and two design technologies (instructional design and visual design)" (p. 18). With this merger of previous technologies, interactive video offers many unique advantages over linear programming for enhancing the transfer of information.

With interactive video now available, it becomes extremely important to analyze whether the interactive videodisc technology is an appropriate technique to use for a particular adult educational program. Lanier (1986) identified some factors to help organizations decide if interactive videodisc is appropriate to use and Tate (1986) identified characteristics of educational technologies which are useful in program delivery. However, specific guidelines are not available. Therefore, some criteria to consider for selecting interactive video as a delivery technique in CES include:

1. Is the size of the potential audience such that developing a videodisc will be cost effective?

2. Is the educational content such that it will not change rapidly or substantially in a short period of time? And is the content applicable across county and state lines?

3. Does the educational content include tasks which need to be shown rather than told?

4. Is the educational content of such a nature that exercises can be provided in which the user applies the information to a personal situation?

5. Would the videodisc program provide expertise in a given area to extend the outreach of specialists and provide accurate in-depth information for use by agents?

6. Would the program provide for information delivery at times not currently available and at locations not currently served?

7. Does the content lend itself to a client-operated instant-access inventory of the subject matter?

Process Evaluation Throughout the Planning and Production Stages

Because of the complex nature of interactive videodisc, the process evaluation throughout the planning and production stages becomes vitally important and can be divided into two distinct components. First, a set of questions to be used informally throughout the planning and production process would help ensure that the finished product meets the goals and objectives in addition to being of high quality design. Secondly, questions to address when the initial check disc is developed would allow for changes in the program before the final disc is stamped.

Questions for Planning and Production Stages

Kearsley and Frost (1985) identified seven design factors which make interactive video effective. These factors include (a) interactivity, (b) visual design, (c) organization, (d) active participation, (e) metaphors and models, (f) personality, and (g) team approach. To produce an effective interactive videodisc, these factors need to be addressed throughout the development and production stages by the team managing the project. Broad guiding questions which will help address these factors include:

1. Are the roles of each team member identified and has communication occurred so all members understand each role?

2. Are project management guidelines in place to ensure that input from various team members will be provided in a timely fashion?

3. Based on the expectations of the users, what are the goals and objectives for this particular program?

4. What is the essential content and at what depth will it be addressed?

5. What is the most desirable organizational structure for this content?

6. What type of user control options (e.g.: quit, go back, etc.) must be considered for the given audience and the given content?

7. What level of interactivity is most appropriate for the given project?

8. What is the purpose of feedback and how is it to be utilized in the program design?

9. Does the content lend itself to a personal application for the user? If so, how?

10. What quality is desired for the video sequences, the animation, and the still frames; and how should these components relate and interact with each other in the finished product?

11. Does the collective function of the soundtrack, narrative, visuals/graphics, type of learner involvement, and instructional strategies employed create a mood (or affective state) which enhance the achievement of affective outcomes?

Questions Related to the Check Disc

The check disc provides for an initial check on the content and the production of the program. Questions to consider in using the check disc as an evaluative tool include:

1. Who checks the flow of the content and the sequencing; and is money and time allotted to make necessary corrections?

2. Who checks the production technicalities and is there money and time allotted to make necessary corrections?

Assessing the Utilization of Interactive Videodisc in Cooperative Extension

Studying the adoption of a new technology in an educational system requires (a) the identification of interested persons, (b) an overall strategy for testing the technology, and (c) a method for delivering evaluative information to decision makers throughout the system. To meet these needs, IVEN (Interactive Video Extension Network) was created in CES in 1985 (Tate, 1986). Over 100 educators in 30 states who recognize the educational potential of the marriage between video and computers founded the network.

IVEN members are active in acquiring and testing new interactive video systems. Through the interest of individuals in IVEN, agricultural delivery systems are now being tested in 22 states. IVEN plans also call for testing a variety of new programs in different settings and with diverse audiences.

Various issues and questions about interactive videodisc need to be addressed by the IVEN members as the technology is being implemented into the system. To provide appropriate information for decision makers, evaluation needs must be identified within CES at an early stage in the implementation process. Therefore, to assess this new technology, evaluation must address questions which can be answered immediately (short-term needs) as well as those which require testing over a longer period of time (long-term needs).

Short-term Needs

Immediate short-term needs can be divided into three general categories of assessing (a) the cost of using interactive video as a delivery mode, (b) staff training needs for utilization of the medium, and (c) acceptance of, utilization of, and educational value of the technology for both staff and clientele.

Cost of using interactive video. How does interactive video compare to other alternative investments? Assessing the total number who are in the potential audience provides the basis for starting to identify cost/effectiveness. To decide if utilization of the technology is economically feasible, consideration must be given to the cost per lesson and the cost per client use based on the production costs of a given lesson. How does the cost for delivering a lesson on interactive video compare with the the cost of delivering comparable information through other methods?

Another issue related to cost is the assessment of the dollars needed for purchasing the equipment required to use the technology. Consideration needs to be given to identifying how this equipment is then managed and scheduled within an Extension office; or if utilization of the technology requires additional equipment which is located at sites more convenient for clientele use. Another question relates to how many disc stations need to be in use to make interactive video economically feasible nationwide assuming current costs and 1990 costs.

Development costs and the cost of adapting the content to a particular location and updating materials are other questions. The costs associated with adapting the program to work on different computers also needs to be addressed.

Staff training needs. As with any new technology, staff need the opportunity to learn about interactive video, its potential and its applications within the educational system. What kind of educational experiences are needed and who needs these educational experiences?

Specific staff training is required for those who might be developing and producing the videodisc. The type, amount, and focus of the training required is yet to be determined.

Specific staff training is also required for effective utilization of the interactive video. What type of education and support is needed in terms of using and maintaining the equipment? What are effective marketing approaches which will maximize the use of the educational materials?

Acceptance of, utilization of, and educational value. Evaluation questions need to address how both staff and clientele accept and utilize the product. In regard to the staff, what are the positive feelings about the use of the interactive video program? What are the barriers which inhibit maximum utilization?

What are the pros and cons of using interactive videodisc for individualized instruction? ...for group instruction? Does the program need to be changed or adapted for various instructional situations?

For the clientele, evaluation needs to address how much they learn, retain, and apply to their own situation. How does the knowledge clientele gain, retain, and apply from a videodisc program compare with other learning situations? In addition, how do clientele feel about the educational experience? And, what problems do they have using the equipment?

Long-term Needs

If the interactive video is indeed a viable delivery mode to utilize in Extension, long-term evaluation needs must be considered and addressed. One high priority issue focuses on identifying and prioritizing program needs which can be addressed most effectively with the interactive video technology. A related issue is identifying budgetary needs -- how much money is needed for program production and implementation and where does this money come from?

Although the educational value of interactive video is considered an immediate need, it is also a continuing need which must be tested over time.

Research on the application of interactive video in adult learning will continue on a long-term basis. Questions which need to be more fully addressed include those related to the use of feedback; and those related to instructional design. In addition, other questions about adult learning with the interactive video which are not yet realized will surface as educational applications are used.

Implications of Interactive Videodisc for Research in Adult Education

Brody (1984) distinguishes between RESEARCH ON and RESEARCH WITH interactive videodisc. RESEARCH ON videodisc refers to determining how the effectiveness of the medium can be increased; and to determine how the medium relates to the broader instructional environment. RESEARCH WITH interactive video refers to using the medium with its unique set of characteristics to study questions which are related to issues other than interactive video.

Research On Videodisc

For adult education there are a considerable number of questions to be addressed as interactive video is tested for its application in transferring information to adult learners. Although more questions will arise as the medium is tested in various settings and situations, some of the questions to address with the medium in its current developmental phase include:

1. What type of content is most appropriate and which learning theories are most relevant to use in various adult educational applications?

2. How much and what kind of interactivity is most appropriate to build into the program? Is this interactivity used as a checking mechanism for branching? Does it serve as an information-gathering device? Does it allow for adults to practice applying knowledge to a personal situation?

3. How much and what kind of feedback is most effective for adults?

4. How is it most appropriate to help adults apply the program content to their own situation?

5. How does the utilization of videodisc relate to the entire instructional environment for adults?

6. Who decides on what programs will be developed and how they will be structured?

7. What does it mean to integrate this new technology into an adult educational system in terms of:

(a) type, amount, and management of hardware and software?
(b) staff training for program development and utilization?
(c) dollar support for program development?
(d) acceptance by staff and clientele?

Research With Videodisc

The unique characteristics of interactive videodisc -- the realistic audio and visual features from television technology along with the text, graphic and management capabilities from computer technology -- make the medium very attractive for research related to adult learning.

The ability to record specific information allows for research designs which call for students direct responses to a given set of materials. The ability to track a path the student might follow allows for research designs which utilize the branching features of interactive videodisc. Together these features provide a research tool to study adult learning styles in processing and applying new information.

This ability to collect data in an unobtrusive manner by recording or tracking responses raises ethical issues, particularly if the student is being asked to enter personal information. At what point does this process violate an individuals right for confidentiality?

As adult educators become more aware of the unique features of the technology and use it for adult research, more creative and innovative research questions will emerge. At the same time, new research strategies may be identified to deal with the questions.

Summary

Utilization of interactive videodisc technology as an educational tool in Cooperative Extension has profound implications for the future as services and opportunities are provided for adult learners. The evidence documenting equal or better knowledge gain, less time required for the educational process, and positive feelings about instruction via videodisc can not be ignored.

A pilot project, "Cash Flow Planning for Farmers", field tested an educational application of interactive video in the Cooperative Extension Service. Initial findings identified numerous problems related to implementation throughout the target sites which need to be addressed as the technology becomes more widely used. However, the initial findings also indicated the user felt very positive about the educational experience.

There are a considerable number of questions which need to be addressed as interactive video is evaluated for its application in Cooperative Extension. Because of the complex nature of interactive video, process evaluation is extremely important and can be divided into two components -- that which occurs through the planning and development stages and that which occurs in the initial check of the program using the check disc.

As interactive video is being assessed as a delivery method in Extension, evaluators must begin to systematically analyze the integration process which can be addressed through both short- and long-term evaluation needs. This analysis is vital in examining the new delivery system to see if it provides economical, strategic, ecological, and/or social benefits and advantages. If the new delivery system does provide one or more of these benefits, is it economically and organizationally feasible to continue implementation of the innovative delivery system?

There are also a considerable number of questions which need to be addressed as interactive video is tested for its application in adult learning situations. Questions related to program development include those which focus on program content, interactivity, feedback, and the application to personal situations. Questions related to institutional use include those which focus on the total instructional environment and how an adult educational system can manage the development and implementation of interactive video.

The evaluation issues identified here should not be considered as a final evaluation plan. Rather, they should be viewed as broad guidelines, representing they types of issues which must be addressed immediately and the types of issues which may surface as long-term evaluation needs.

In summary, considering the adoption of interactive video raises many questions about how one starts applying the technology in a particular situation, challenges the system to explore various ways to apply the technology in adult programs, and provides an opportunity to use the technology as a research tool for adult education.

Educational institutions must take the lead in helping American society properly assess this new educational opportunity. To assure that the new delivery system, interactive video, gets a fair trial, a variety of modules need to be tested in a variety of contexts and situations.

References

Andriessen, J. J., Kroon, D. J. (1980). Individualized learning by videodisc. Educational Technology, March, 21-25.

Bitney, L., Lanpher, B. & Blankenau, G. (1986, July). Managing cash flow using an interactive videodisc/computer program. Paper presented at American Agricultural Economics Association, Reno, Nevada.

Braden, R. A. (1986). Visuals for interactive video: Images for a new technology (with some guidelines). Educational Technology, May, 18-22.

Brody, P. J. (1984, April). Research on and research with interactive video. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Bunderson, C. V., Baillio, B., & Olsen, J. B. (1984). Instructional effectiveness of an intelligent videodisc in biology. Machine Mediated Learning, 1(2), 175-215.

Bunderson, C. V., Olsen, J. B., & Baillio, B. (1981, January). Proof-of-concept demonstration and comparative evaluation of a prototype intelligent videodisc system. Learning Design Laboratories, WICAT, Inc., Orem, Utah: Author.

Daynes, R. & Butler, B. (Ed.s). (1984). The videodisc book: A guide & Directory. New York: John Wiley and sons.

DeBloois, M., Jaki, K. C. & Hall, A. F. (1984). Effectiveness of interactive videodisc training: A comprehensive review. The Videodisc Monitor. Falls Church, VA: Future Systems Incorporated.

Deter, R.S. (1986, October). Interactive videodisc technology for the Extension office. Paper presented at National Association of Extension Home Economist, Grand Rapids, MI.

Gibbons, A. S., Olsen, J. B., & Cavagnol, R. M. (1982, May). Hawk Training System: Evaluation Report WICAT Systems, Inc. Orem, Utah: Author.

Hannafin, M. J. & Schaffer, L. (1984, April). The effects of systematically varied interactivity on learning from interactive video. Paper presented at the meeting of the American Educational Research Association, New Orleans, LA.

Kearsley, G. P. & Frost, J. (1985). Design factors for successful videodisc-based instruction. Educational Technology. March, 7-13.

Lanier, R. (1986). The interactive videodisc is in motion. E-ITV, 18(4), 36-43.

Smith, R. C. (1985, September). Full-scale pilot testing of Florida's videodisc training project. Pensacola, FL: University of West Florida, Office for Interactive Technology and Training.

Tate, T.G. (1986, October). The role of interactive video in agricultural education (IVEN working paper #3). Washington, D.C.: U.S. Department of Agriculture.

Vadas, J. E. (1986, August). Interactive videodisc for management training in a classroom environment. Paper presented at the Conference of Interactive Videodisc in Education and Training, Washington, DC.